PHILIP DECROOS

3B MECHATRONICS UWATERLOO

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SKILLS

- Languages: Python, C++, C, JavaScript, HTML/CSS, C#, Splunk, MATLAB, SQL
- Tools: Git, Jira, Jenkins, Linux, FreeRTOS, Pandas, TensorFlow, Kafka, Kubernetes, Docker, Power BI
- Hardware: Raspberry Pi, Arduino, STM32, DC Motor Drivers, Multimeters, Oscilloscopes, Soldering, SolidWorks

EXPERIENCE

Firmware Integration Engineering Intern — Tesla / Sep 2023 - Dec 2023

- Built a cloud service to update configurations for cars during production, eliminating the manual process done 10 times per month (Python, Kafka, Kubernetes, Docker).
- Automated the validation process for changes to vehicle diagnostics firmware, removing 2 hours of validation work per PR (Python).
- Debugged firmware issues for new programs to fix them before the start of production (C, Linux, CAN, LIN). For example, I diagnosed and fixed a bug that blocked LIN communication with the new headlamp module.
- Built Splunk dashboards to support the process engineering team with tracking key production metrics.

Firmware Developer — Midnight Sun Solar Car Team / Feb 2023 - Sep 2023

- Wrote embedded firmware for driver controls including steering, indicators, and cruise control (C, FreeRTOS).

Software Test Engineering Intern — Ansys / May 2023 - Aug 2023

- Built an optimization tool for the regression test suite that reduced the computing resources required for testing by ~$10,000/year (Python).
- Wrote a code coverage analysis tool that maps which code is used by which tests and flags gaps in test coverage, eliminating the manual review every 3 months (Python, Pandas, Power BI).
- Validated new features and debugged issues for Ansys System Coupling 2024 R1 (C). For example, while testing the new dark theme for the UI, I found and fixed a bug causing one of the menus to display incorrectly.

Software Engineering Intern — Ford / Sep 2022 - Dec 2022

- Built a pipeline to automate the software package building and deployment process, eliminating 3 days of work per month (Python, Jenkins).
- Developed a production test running on embedded vehicle controllers to validate their device codes and addresses, eliminating 100% of serialization defects (C++, Linux).
- Wrote test scripts to inspect hardware connections to GPIO, CAN buses, etc. during manufacturing (C#).
- Designed and built a test fixture to simulate the presence of peripherals for a vehicle controller (SolidWorks).

PROJECTS

Self-Driving Model Car — GitHub

- Wrote a computer vision model to identify the boundary of the road and plan a path to drive the car around the track as fast as possible (Python, TensorFlow).
- Designed, manufactured, and integrated a model car controlled by an Nvidia Jetson Nano (SolidWorks).

Tic Tac Toe Neural Network — Try it / Video / GitHub

- Built a neural network from scratch and trained it to play Tic Tac Toe with 97.3% accuracy (Python).

Lunar Lander Game — Video / GitHub

- Wrote a video game in which the player navigates ten moon landings (Python, Pygame).

EDUCATION

Bachelor's in Mechatronics Engineering Co-op — University of Waterloo / 2020 - 2025